

Application No. 10/747,616
 Response to Office Action mailed January 24, 2006
 Atty. Dkt. No.: C261.1040.1

In the Specification:

Please replace the paragraph beginning on page 2, line 24, with the following amended paragraph:

Prior art processes [U.S. Pat. No. 5,543,223, U.S. Pat. No. 5,830,545, U.S. Pat. No. 4,753,832] to achieve barrier properties in packaging materials are based on the multi-layer polymer films, where the barrier property is given by materials like, ethylene-vinyl alcohol copolymer (EVOH), ~~Saran~~Saran[®]-Polyvinylidene fluoride (PVDF), Metallised PP etc. These materials are expensive compared to the general purpose plastics like PE or PP and also involve energy intensive melt mixing and extrusion techniques to make the multi-layer material. Research and developments efforts are being reported to make barrier materials based on amorphous polymers. As opposed to the prior art, the present invention uses coating compositions, without using any expensive processing operations or additives to make barrier coating materials.

Please replace the paragraph beginning on page 5, line 27, with the following amended paragraph:

Composition I

| | |
|---|-----------------------|
| Epoxy resin | 24-48% |
| TiO ₂ | 24-48% |
| Talc | 9-22% |
| Clay | 0-30% |
| Colorant | 0-1% |
| Barytes | 0-5% |
| Nilset [™] Nilset [™] 117 | 0.1-0.2% |
| Hapco [™] Hapco [™] NXZ | 0.05-0.1% |
| Dispersitol [™] Dispersitol [™] | 0-0.1% |
| Berchi [®] Berchi [®] GOL E2 | 0.5-0.8% |
| Solvent | q.s (for application) |

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Please replace the paragraph beginning on page 6, line 4, with the following amended paragraph:

Composition II

| | |
|--------------------------------|------------------------|
| Alkyd resin | 24-48% |
| TiO ₂ | 24-48% |
| Talc | 9-22% |
| Clay | 0-30% |
| Catalyst | 0.1-0.5% |
| Colorant | 0-1% |
| Barytes | 0-5% |
| Nilset TM 117 | 0.1-0.2% |
| Hapcol Iapco TM NXZ | 0.05-0.1% |
| Dispersitol TM | 0-0.1% |
| Borchil TM GOL E2 | 0.5-0.8% |
| Solvent | q.s. (for application) |

Please replace the paragraph beginning on page 6, line 17, with the following amended paragraph:

Composition III

| | |
|--------------------------------|------------------------|
| Polyester polyol + isocyanate | 24-48% |
| TiO ₂ | 28-40% |
| Talc | 9-22% |
| Clay | 0-30% |
| Colorant | 0-1% |
| Barytes | 0-5% |
| Nilset TM 117 | 0.1-0.2% |
| Hapcol Iapco TM NXZ | 0.05-0.1% |
| Dispersitol TM | 0-0.1% |
| Borchil TM GOL E2 | 0.5-0.8% |
| Solvent | q.s. (for application) |

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Please replace the paragraph beginning on page 6, line 29, with the following amended paragraph:

Composition IV

| | |
|---------------------------------------|-----------------------|
| Castor polyol + isocyanate | 24-48% |
| TiO ₂ | 18-40% |
| Talc | 9-22% |
| Clay | 0-30% |
| Colorant | 0-1% |
| Barytes | 0-5% |
| NikelNilset TM | 0.1-0.2% |
| Hapcol Iapco TM NXZ | 0.05-0.1% |
| Dispersitol Dispersitol TM | 0-0.1% |
| Borch Borch [®] GOL E2 | 0.5-0.8% |
| Solvent | q.s.(for application) |

Please replace the paragraph beginning on page 7, line 1, with the following amended paragraph:

Composition V

| | |
|---------------------------------------|------------------------|
| Uralkyd resin | 28-40% |
| TiO ₂ | 31-52% |
| Talc | 9-22% |
| Clay | 0-30% |
| Catalyst | 0.1-0.5% |
| Colorant | 0-1% |
| Barytes | 0-5% |
| NikelNilset TM 117 | 0.1-0.2% |
| Hapcol Iapco TM NXZ | 0.05-0.1% |
| Dispersitol Dispersitol TM | 0-0.1% |
| Borch Borch [®] GOL E2 | 0.5-0.8% |
| Solvent | q.s. (for application) |

Please replace the paragraph beginning on page 8, line 13, with the following amended paragraph:

Example. 2

| | |
|------------------|------|
| Epoxy resin | 34 % |
| TiO ₂ | 34% |
| Talc | 6% |

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| | |
|------------------------------|------------|
| Calcined clay | 4.8-28% |
| Colorant | 0.1% |
| Barytes | 5% |
| Nilset TM 117 | 0.1-0.2% |
| Hapco TM NXZ | 0.05 -0.1% |
| Dispersitol TM | 0.1% |
| Borchhi [®] GOL E 2 | 0.5-0.8% |
| Solvent | 25% |

Please replace the paragraph beginning on page 9, line 22, with the following amended paragraph:

A pressure differential of about 1-5 kgs/cm² (100-500 kPa) was maintained across the membrane during experiments. All experiments were conducted at room temperature (30 +/- .2°C). The feed and permeate lines were initially evacuated by means of a vacuum pump. Pure oxygen was introduced slowly into the feed line by means of a mass flow controller. The desired feed pressure difference was maintained in the test cell. The permeate gas, sample was collected in SS 316 gas sampler using iolar grade nitrogen (>99.9% purity) as the carrier gas (the flow rate of the carrier gas was controlled by a soap bubble meter). Only steady state samples were collected. The feed and permeate samples were analyzed with ~~Nucon~~NuconTM Gas

Chromatograph Model 765, India, equipped with a CTR dual column and a Thermal conductivity Detector (TID). The concentration of the permeated oxygen was determined and gas permeability's were calculated.

Please replace the paragraph beginning on page 10, line 21, with the following amended paragraph:

Example 3

| | |
|------------------|-------|
| Alkyd | 38.5% |
| TiO ₂ | 38% |
| Talc | 6.6% |
| Clay | 4.7% |
| Catalyst | 0.5% |

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| | |
|---|------------|
| Colorant | 0.1% |
| Barytes | 5% |
| Nilset <u>Nilset</u> TM 117 | 0.1-0.2% |
| Hapeol <u>Hapeol</u> TM NXZ | 0.05 -0.1% |
| Dispersitol <u>Dispersitol</u> TM | 0.1% |
| Borchil <u>Borchil</u> [®] Gol E 2 | 0.5-0.8% |
| Solvent | 14% |

Please replace the paragraph beginning on page 11, line 10, with the following amended paragraph:

Example 4:

| | |
|---|------------|
| Polyester polyol | 27.8% |
| Isocyanate | 25% |
| TiO ₂ | 33% |
| Talc | 5.6% |
| Calcined Clay | 4.7 to 28% |
| Colorant | 0.1% |
| Barytes | 5% |
| Nilset <u>Nilset</u> TM 117 | 0.1-0.2% |
| Hapeol <u>Hapeol</u> TM NXZ | 0.05 -0.1% |
| Dispersitol <u>Dispersitol</u> TM | 0.1% |
| Borchil <u>Borchil</u> [®] Gol E 2 | 0.5-0.8% |
| Solvent | 19.8% |

Please replace the paragraph beginning on page 12, line 1, with the following amended paragraph:

Example 5:

Further example of the formulation used is made according to the formulation

| | |
|---------------|-----|
| Castor polyol | 26% |
| Isocyanate | 22% |

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| | |
|--|------------|
| TiO ₂ | 34% |
| Talc | 5.8% |
| Clay | 5-30% |
| Colorant | 0.1% |
| Barytes | 5% |
| Nilset Nilset TM 117 | 0.1-0.2% |
| Hapco Hapco TM NXZ | 0.05 -0.1% |
| Dispersitol Dispersitol TM | 0.1% |
| Borch Borch TM Gol E 2 | 0.5-0.8% |
| Solvent- | 20% |

Please replace the paragraph beginning on page 12, line 22, with the following amended paragraph:

Example 6:

The following example further illustrates the formulation used for the coating composition.

| | |
|--|------------|
| Uralkyd | 48% |
| TiO ₂ | 28% |
| Talc | 4.8% |
| Clay | 4.8-28% |
| Colorant | 0.1% |
| Barytes | 5% |
| Nilset Nilset TM 117 | 0.1-0.2% |
| Hapco Hapco TM NXZ | 0.05 -0.1% |
| Dispersitol Dispersitol TM | 0.1% |
| Borch Borch TM Gol E 2 | 0.5-0.8% |
| Toluene | 7% |

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Please replace the paragraph beginning on page 13, line 17, with the following amended

paragraph:

A comparative data is provided below with the commercially available materials:

11 W, V, T, R O₂ (g/m²..... 24 hr. Sample (cc mil/100in², dat, atm) 38°C 90% RH) Metallized

PP 5.07 3.9-4.8 Saran[®] 311 1 2.8 LDPE 250-800 15.5-18 HDPE 30-250 4.7-10.8 EVOH

1.15 22-59 PET 4.8-9 21 HCT-unmodified coating 11-18 3.44-26 Clay-modified film

1.9-3.1 1.97-3.44 LDPE/paper/HCT coating Below detectable range 2.46-3.26